

vince of Victoria, would be most likely to afford the capital facts noted under the "fourth" head, viz. the impregnated ovum *in utero*, showing some stage of embryonal development in the spiny terrestrial Monotreme. As to the hairy and aquatic *Ornithorhynchus*, the impregnated females in which ova were found in the uterus, of small size, and prior to the formation of the embryo, were caught on the 6th and 7th of October. Young *Ornithorhynchi*, measuring in length in a straight line  $1\frac{7}{8}$  inch, were found in the nest on the 8th of December. The period of impregnation, therefore, in this species, in the locality of the Murrumbidgee River, is probably the latter end of September or beginning of October. Females captured in the latter half of October and in the month of November, would be most likely to have ova *in utero*, exhibiting stages of embryonal development.

Professor Owen earnestly requests anyone who may obtain females of the Platypus or Duck-mole (*Ornithorhynchus*) in October and November, or females of the Porcupine-Anteater (*Echidna*) in July and the first week of August, to preserve the specimens in colourless spirits, the belly being slit open to allow access of the preserving liquor to the interior,—or, to preserve the hinder half of the specimen, the trunk being divided behind the fore limbs—or, at least, the female organs of generation, with the bladder and rectum, preserved in strong colourless spirits. These specimens may be directed to Professor Owen, care of Dr. Mueller, F.R.S., Botanic Garden, Melbourne; or to the care of Dr. George Bennett, F.L.S., Sydney; or they may be transmitted directly, addressed "To the Principal Librarian, British Museum, London," to whom the Bill of Lading should be directed, and the freight will be paid in London.

#### ZOOLOGICAL SOCIETY.

Nov. 8, 1864.—Prof. Huxley, F.R.S., V.P., in the Chair.

NOTES ON THE ZOOLOGY OF SPITSBERGEN. BY ALFRED NEWTON, M.A., F.L.S., F.Z.S.

In the month of May last, Mr. Edward Birkbeck offered me a berth in his yacht, the 'Sultana,' R. T. Y. C., on a voyage to Spitsbergen. As this was a country I had long been desirous to visit, I was very glad of the opportunity of seeing it, which had so unexpectedly presented itself. On the 31st of May I found myself on board the vessel at Lowestoft, and the following morning we sailed northward. After a passage protracted by some tedious calms, we cast anchor in the Bay of Hammerfest on the evening of the 26th June. Here it was necessary to stay for some days, while a Norwegian "*jægt*" was being equipped to accompany us, and to take us, if necessary, into the ice, where the yacht, from her extreme length, would become embarrassed, and from her slight build dangerous. Late in the evening of the 2nd July the necessary preparations were completed, and the 'Semmline,' a sloop of some thirty or forty tons, got under way. The next morning the 'Sultana' fol-

lowed, and, overhauling her consort in the narrow seas, in the course of the afternoon lost sight both of her and the land of Norway. On the afternoon of the 6th July we made the South Cape of Spitsbergen, bearing N.E.

Our first rendezvous having been appointed about halfway up the deep bay marked on English charts as Wibelan's Water, and known to Norsk walrus-hunters as Stor Fjord, which indents the archipelago of islands forming Spitsbergen, our course was altered accordingly; but we were soon brought up, after passing a good deal of drift ice, by the appearance of very closely packed ice, stretching across as far as the state of the atmosphere would allow us to see it. This to our pilot, a man whose knowledge of Spitsbergen is scarcely surpassed by any one's, was a manifest indication of the fjord being completely blocked up, and he did not hesitate to order us to proceed to our second rendezvous in Ice Sound, on the west coast. Thither we made sail, trying as we passed northward successively to enter Horn and Bell Sounds, both of which we found to be impracticable from the same cause as had been the Stor Fjord. On nearing Ice Sound, on the afternoon of the 8th July, we found a good deal of ice drifting out of its mouth; but it was of such a kind as to cause no risk to the ship, with our careful captain and pilot. While we were watching with interest the novel scene presented to us by the varied shapes of the frozen masses through which we were navigating, there was a cry of "White Whales!" and a "school" of *Beluga catodon* passed across our bows. Though there were the vivid hues of drifting ice-blocks with which to contrast them, I was agreeably pleased to see that their colour stood this high trial. When, some years ago, I saw the so-called "White Porpoises" of the river St. Lawrence, identified by Dr. Gray (Cat. Brit. Mus. Cetacea, pp. 78, 79) with this species, they had a very tallowy appearance; now the worst that could be said of these beasts is that they looked the colour and consistency of a good spermaceti candle. There were at least six or eight of them swimming at very short distances from one another, and they glided rapidly through the water with an easy and almost graceful roll, now and then emerging from the surface sufficiently to show the whole of their bodies.

It is not my intention now to say much concerning the birds of Spitsbergen; but I must mention that the Sound we were entering presents one of the most wonderful sights to the eye of the ornithologist that can possibly be conceived. The species which frequent Spitsbergen are few in number, much fewer than had been thought prior to the publication of A. J. Malmgren's admirably critical papers\*; but the number of individuals is past all computation. It will be sufficient here to name the species I observed at this time, and this I shall do somewhat in the order of their comparative abundance. First *Mergulus Alle*, *Uria Arra*, and *Cephus Grylle*; then *Rissa tridactyla*, *Somateria mollissima*, *Procellaria glacialis*, *Fratercula glacialis*, *Larus glaucus*, and, lastly, an *Anser* which I shall specify hereafter. All these, excepting *Larus glaucus*, we found

\* Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar, 11 Febr. 1863.

breeding around Ice Sound, indeed, I may say, in the immediate neighbourhood of Safe Haven, a commodious inlet on its northern shore, where the yacht dropped her anchor on the morning of the 9th July.

The whole of the next week was employed by our party in exploring, with different objects in view, the shores of the Sound, or, as it should be more properly called, fjord, for it extends at least fifty miles into the interior, and appears to have no connexion with Wibelan's Water or any other inlet of importance. Almost every depression on its northern side is occupied by a glacier, which generally fills it nearly to the brim, and, with but one exception, these glaciers are only terminated by the sea; but along its southern shore are some four or five bays of various sizes, and between them various valleys which, being quite free from ice, are more or less fertile and afford sufficient pasturage for numerous herds of *Rangifer tarandus*. These Deer are tolerably abundant: they are certainly smaller than the Lapland Reins, whether wild or tame; and though I can hardly profess to speak generally on the subject, yet all the antlers which I saw in Spitsbergen seemed to me to be slighter in the beam than those of the continental race; nevertheless, the points being in old stags considerably elongated, the expanse of antler was not much inferior. The average type of a good Spitsbergen head is very well represented by the first figure in the 'Fauna Boreali-Americana' (vol. i. p. 240), of the so-called Barren-ground Caribou (*Cervus tarandus*, var. *α. arctica*, Richardson); and it is probable that the same causes which influence the development of the antlers in the Rein-Deer of the *mauvaises terres* in North America affect in like manner those of their Spitsbergen brethren. These last are said, by persons who have wintered there, not to migrate from the country; at least they or their tracks on the snow are seen "as soon as it begins to get light" in spring. At the same time it is just possible that some of them may wander over the frozen sea by way of Giles Land, and other islands, perhaps, of which we have as yet no knowledge, to Nova Zembla, and so on to the country of the Samoides. Certainly a hind killed by my friend Mr. Graham Manners-Sutton had one ear slit in a manner which was recognized by some of the 'Semmoline's' crew (most of them Quæns) as a mark of ownership. I must, however, add that, averse as I am to doubt the technical knowledge of an expert, the slit in question seemed to me as if it might have been very well caused by another deer in fighting, or, even if it were of human origin, such as might have been made by some one who had caught the animal when a calf, and let it go again; but this last solution of the difficulty excited a laugh at my simplicity among the Quæns, who could not conceive it possible that a hungry hunter should show compassion towards the very youngest deer. All that we saw the first week of our being in the country still retained a considerable quantity of their nearly white winter clothing, thus rendering their detection, when viewed against the dark-coloured ground, a very easy matter even at a great distance. These animals also were in poor condition, contrasting in this respect

strongly with those killed about a month later, when their bodies on being flayed were found to be covered with fat nearly two inches thick. At this time they had entirely got rid of their overcoats, and were clothed entirely in a short but close felt of dark mouse-colour. Judging from the gralloch, in the summer, lichens seem to form only a small article in their diet, their food then consisting chiefly of mosses, grasses, and any other herbage.

The Arctic Fox (*Canis lagopus*) is pretty numerous along the shores of Ice Sound; and we not only frequently saw examples of it, but in the immediate neighbourhood of the cliffs wherein the *Alcidae* were nesting one could, by listening almost at any time in the twenty-four hours, hear its yapping bark. It is of course the chief enemy of all the different kinds of birds, and their dread of it appears to influence them greatly in their choice of breeding-quarters. What the Foxes do to get a living in winter when the birds have left the country—for I imagine that the Ptarmigan (*Lagopus hemileucurus*) is the only species that is permanently resident—is one of the most curious questions that has presented itself to my mind for some time. The greater number of them are said to remain on the land, and to be as active during the long polar night as they are in summer; yet there are no berries by which they might eke out their existence, and there can be no open water, on the margin of which they might find food, within miles of their haunts. The most natural explanation that occurs to one is that they lay up a stock of provisions; but nobody, that I am aware of, has ever found such a store-closet\*, or has observed any tendency to hoarding in their habits. In Spitsbergen I believe that none of the varieties known as the Blue, the Black, or the Silver Fox have been noticed. The summer pelt does not differ from what it ordinarily is in other countries, and the winter coat seems to be invariably white†.

We noticed two species of *Phocidæ* in the waters of Ice Fjord. I am indebted to Mr. Malmgren for the information that these are the *Callocephalus fœtidus* and *Phoca barbata* of Dr. Gray's 'Catalogue of Mammalia in the British Museum.' The former is called by the Norwegians who frequent the coast of Spitsbergen "Steen-Kobbe," or Stone-Seal, probably because it is usually seen near rocks,

\* Since the above was written, it has occurred to me that a considerable collection of shells of *Mya truncata*, which I found one day on the moraine of a glacier in Safe Haven, may possibly have been due to the cause suggested in the text.

† I have never seen it remarked, though it is unquestionably the case, that nearly all the Icelandic examples of *Canis lagopus* are "Blue" Foxes; that is to say, their winter coat is of nearly the same colour as their summer coat. This fact, I think, must be taken in connexion with the comparatively mild climate which Iceland enjoys in winter, and, if so, is analogous to the circumstance of the Alpine Hare (*Lepus timidus*, Linn., non auct.) always becoming white in winter in Scandinavia, generally so in Scotland, and but seldom in Ireland. The Common Squirrel (*Sciurus vulgaris*) is another case in point; and all three may be considered illustrative of the vexed questions of the specific distinctions between the Great Northern Falcons (*Falco gyrfalco*, *F. candicans*, and *F. islandicus*), and of the specific identity of the Red and Willow Grouse (*Lagopus scoticus* and *L. albus*).

or at any rate at no great distance from land; the latter is known as "Stor Kobbe," Great Seal, or less frequently "Blaa Kobbe," Blue Seal. How this last name came to be applied to it I do not know. As far as I can judge, it is very inappropriate. When dry, its fur is of a dirty yellowish white; and a beast of this species lying on a floe has exactly the appearance of a lump of discoloured ice, so that the hunter often takes one for the other. In the water it seems to be much of the same colour as most Seals—a dark iron-grey above, lighter beneath. It is a very powerful animal: I saw one that had received three Enfield-bullets through the nape of its neck, and had been bleeding profusely for about half an hour; yet it nearly succeeded in capsizing a large whale-boat with five men in her, owing to the clumsiness of the harpooner. We constantly saw this species at a considerable distance from land—ten to twenty miles, off the west coast of Spitsbergen, mostly between Bell Sound and Ice Fjord; and a young male of the previous year was shot from the deck of the yacht, and afterwards harpooned, on the 29th July, about fifteen miles from South Cape.

We saw no other mammals in Ice Fjord. Our pilot pointed out to me one day a place where, many years ago, a *jægt's* crew, of which he himself was one, killed nine Polar Bears; but no such good fortune attended us. This same man informed me that he knew of the occurrence in Spitsbergen of a "Hermelin," a species which has not hitherto been recorded from that country, though it is probable that the "creature, somewhat larger than a weasel, with short ears, long tail, and skin spotted white and black," stated to have been seen on Low Island by Dr. Irving in Lord Mulgrave's Voyage\*, was nothing else but *Mustela erminea*.

I must here mention the pleasure it was to me, and, I am sure, to all the other members of our party, to fall in with the Swedish Scientific Expedition, who are engaged in making a series of preliminary surveys, preparatory to measuring an arc of the meridian, in Spitsbergen. To Professors Nordenskjöld and Dunér and Mr. Malmgren our best thanks are due for their kindness in furnishing us with much valuable information, the results of their former arduous explorations in this distant country.

On leaving England there had been two points in the ornithology of Spitsbergen to which I had especially meant to apply myself. The first was the obtaining of a good series of specimens of the Spitsbergen *Lagopus*, a single example of which, brought from that country in 1855 by my friends Mr. W. Sturge and the late Mr. E. Evans, had been described by Mr. Gould in our 'Proceedings' for 1858 (p. 354) as a distinct species under the name of *L. hemileucurus*; the second was the determination of the large species of Wild Goose, which the same gentlemen found breeding on the shores of Ice Fjord (Ibis, 1859, pp. 171, 172). Of the latter, as I have already mentioned, we saw a considerable number; and though we failed in our efforts to obtain a specimen, yet, through Mr. Malmgren's kind-

\* 'A Voyage towards the North Pole undertaken by His Majesty's command, 1773.' By Constantine John Phipps. London: 1774, page 58.

ness, I am able to declare that the species is *Anser brachyrhynchus*, since I saw and examined two examples in his possession. Of the first, though, I regret to say, unsuccessful in finding out its haunts, I likewise had the pleasure of being shown by Mr. Malmgren an adult male, killed but a few days previously, and still unskinned. Its plumage, however, presented scarcely any trace of the great vernal change which takes place in this group of birds; and, except that I am confident that the Ptarmigan of Spitsbergen is distinct from that of continental Europe and Britain, I hardly like to form an opinion respecting its specific distinctness from the Ptarmigan of Iceland, Greenland, and Labrador, which I am inclined to consider as forming but one species, to which the name *L. rupestris*, being the oldest, should probably be applied.

After passing an agreeable week in Ice Fjord, and being joined by our Norwegian consort, we returned southwards, and proceeded towards the most western of the Thousand Islands. Here some of our party were transhipped to go to the eastward in the *jægt* in search of Walruses, while the 'Sultana' made another attempt to ascend the Stor Fjord; but, finding the ice at a distance of about twenty miles above the bight still unmoved, she was compelled to retrace her course, and await the return of the *jægt* party off the Thousand Islands. In Stor Fjord we made the acquaintance of the third species of Seal known in Spitsbergen, the very widely distributed *Pagophilus grœnlandicus* of Dr. Gray's Catalogue. This animal is known to the frequenters of the coast as the "Jan-Mayen Kobbe" and "Svart-side;" but most generally as the "Springer," from its lively actions in the water. It is of a sociable disposition, and we saw it in herds not less than fifty in number. These were very fond of swimming in line, their heads alone above water, engaged in a game of "follow-my-leader;" for on the first Seal making a roll over, or a spring into the air, each Seal of the whole procession, on arriving at the same spot, did the like, and exactly in the same manner. While viewing this singular proceeding (and I had many opportunities of doing so), I could not but be struck with the plausibility of one of the suggested explanations of the appearance which has obtained so wide-spread a notoriety under the name of the "Great Sea Serpent." If any rule of the game in which *Pagophilus grœnlandicus* loves to indulge ever would permit the leading Seal to swim (say) one-third out of water, as I have often seen *Phoca barbata* do, I could quite understand any person, not an unromantic naturalist, on witnessing for the first time such a sight as I have tried to describe, honestly believing that the mythical monster was actually before his eyes. I never had the opportunity of closely examining a "Springer;" but one learned immediately to distinguish this species from the other two I have mentioned: not only its wonderful activity in the water, but its elongated head (even when the size of its body, just about intermediate between *P. barbata* and *Callocephalus foetidus*, was not to be ascertained) was quite sufficient for that purpose. This species resorts in great numbers to the ice in the neighbourhood of Jan Mayen, whence one of its common names; and in former

years several vessels were annually equipped at Tromsö and Hammerfest in pursuit of it; but I believe that of late this practice has been a good deal discontinued.

Although none of our party were lucky enough to get a glimpse of a Walrus, I cannot refrain from mentioning here some circumstances connected with the history and habits of that curious and mighty beast. It is pretty well known that in the summer of 1853 a living example was deposited in our Gardens, which, however, after a few days languished and died, probably from having been fed on a diet so unnatural to it as oatake\*. Yet this is by no means the only instance of this animal being brought alive to England. So long ago as 1608, the ship 'God-speed,' commanded by Master Thomas Welden, performed a voyage to Cherie, now commonly called Bear Island, and in the account of the expedition it is written—

“On the twelfth [July] we took into our ship two young Morses, male and female, aliue: the female died before we came into *England*: the male liued about ten weeks. When wee had watered, we set sayle for *England* about foure of the clocke in the morning. \* \* \*

“The twentieth of August, wee arriued at *London*; and hauing dispatched some priuate businesse, we brought our liuing Morse to the Court, where the king and many honourable personages beheld it with admiration for the strangeness of the same, the like whereof had neuer before beene seene aliue in *England*. Not long after it fell sicke and died. As the beaste in shape is very strange, so is it of strange docilitie and apt to be taught, as by good experience we often proued” †.

Now surely what a rude skipper in the days of James I. could without any preparation accomplish, this Society ought to have no great difficulty in effecting; and I trust that the example may not be lost upon those who control our operations. From inquiries I have made, I find it is quite the exception for any year to pass without an opportunity of capturing alive one or more young examples of *Trichechus Rosmarus* occurring to the twenty or thirty ships which annually sail from the northern ports of Norway, to pursue this animal in the Spitsbergen seas. It has several times happened that young Walruses thus taken are brought to Hammerfest; but, the voyage ended, they are sold to the first purchaser, generally for a very trifling sum, and, their food and accommodation not being duly considered, they of course soon die. Lord Dufferin bought one which had been taken to Bergen, and succeeded in bringing it alive to Ullapool ‡; and Mr. Lamont mentions another which he saw in the possession of Captain Erichsen §. In making an attempt to place a live Walrus in our Gardens, I do not think we ought to be

\* See 'Zoological Sketches,' by J. Wolf; edited by P. L. Scater. Cf. also J. E. Gray, P. Z. S. 1853, p. 112.

† HAKLUYTUS POSTHUMUS OR PURCHAS HIS PILGRIMES, &c. By Samuel Purchas, B.D. London: 1624, vol. iii. p. 560.

‡ Letters from High Latitudes, pp. 387-389.

§ Seasons with the Sea-Horses, pp. 26, 27.

discouraged by the bad luck which has attended our efforts in the case of the larger marine Mammalia. Every person I have spoken with on the subject corroborates the account given by honest Master Welden of the "strange docilitie" of this beast; and that in a mere financial point of view the attempt would be worth undertaking is, I think, manifest. To the general public perhaps the most permanently attractive animals exhibited in our Gardens are the Hippopotamuses and the Seals. What, then, would be the case with a species like the Walrus, wherein the active intelligence of the latter is added to the powerful bulk of the former? There is also another consideration why we should make the attempt. In a few years it is probable that the difficulties of obtaining a live example of the Walrus will be much greater. Its numbers are apparently decreasing with woful rapidity. The time is certainly not very far distant when *Trichechus Rosmarus* will be as extinct in the Spitsbergen seas as *Rhytina gigas* is in those of Behring's Straits. I see no reason to doubt the assertion, or perhaps it would be safer to say the inference, that in former days Walruses habitually frequented the coasts of Finmark; in the sixteenth and seventeenth centuries they were certainly abundant about Bear Island: they are spoken of there, as "lying like hogges upon heaps" by the old writer I have before quoted; yet for the last thirty years probably not one has been seen there. Now they are hemmed in by the packed ice of the Polar Sea on the one side and their merciless enemies on the other. The result cannot admit of any doubt.

But to continue my story from this digression, which I hope, however, may not be without its use. On the 10th of August our two ships again joined company; and, finding it was useless attempting either to get up the Stor Fjord or sail further to the eastward, we again rounded the South Cape and made for the northward. The season, however, being now so far advanced, our pilot declined the responsibility of taking the yacht further north than Ice Fjord; and accordingly, after having to steer considerably to the westward to avoid the heavy ice which beset the coast about Horn Sound, we found ourselves, on the afternoon of the 14th, once more at our old anchorage in Safe Haven. Here we remained another week, most of our party finding plenty of occupation in deer-stalking; but I was not able to add much to my stock of zoological knowledge. The deer were now in magnificent condition, and nineteen were shot, making, with those obtained the week the yacht was there in July, a total of forty-seven. On the night of the 17th the salt water of the Haven was frozen over, and two days afterwards the sun set. On the morning of the 21st we weighed anchor, homeward-bound. On the 24th we spoke a Norwegian *jægt*, engaged in the fishing of *Scymnus borealis*, an example of which was hauled up just as we passed\*.

\* This fishery has of late years assumed considerable importance. The vessels employed in it mostly do not go so far north, but keep about midway between Bear Island and the North Cape of Europe. There they anchor in deep water with a light cable, which they cut if it comes on to blow suddenly. The Sharks are caught with a baited hook at the end of a very long line. As soon as one is



The same day we sighted Bear Island, which on our outward voyage we had not seen, owing to the fog; and on the 27th we reached Hammerfest.

It remains for me to add a few words on the Cetaceans we saw. I have already mentioned *Beluga catodon*, which we observed also on two other occasions. This is the only species of which I can speak definitely, though we certainly saw at least four others. Of these, the first was a large black Fin-backed Whale, noticed three or four times; the second a smaller animal, perhaps about thirty or forty feet long, of which some half a dozen came and played round the yacht on the 12th of August. In general form, especially in the *esocine* shape of the head, these corresponded very closely with the engraving given by Dr. Scoresby (Arctic Regions, vol. ii. pl. 13. f. 2) as that of *Balæna rostrata* (= *Balænoptera rostrata*, J. E. Gray); but I rather hesitate to refer them positively to that species, on account of their colour, which was apparently of a uniform light reddish brown. I had an excellent opportunity of observing these Whales, for they kept with us about a quarter of an hour, sometimes passing under the ship, and often coming up close alongside, within perhaps thirty yards. On the following day I saw a school of Grampuses, with extremely long and high dorsal fins; but this was the only occasion on which this species was noticed. Some kind of Porpoise, on the contrary, was seen more than once\*. In addition to these Cetaceans, the Right Whale (*Balæna Mysticetus*) and the Narwhal (*Monodon monoceros*) are well known to inhabit the Spitsbergen seas. Mr. Malmgren, in his careful paper before alluded to, enumerates six or perhaps seven species of Whales, not reckoning a Porpoise. We therefore have seven or eight Cetaceans, seven Carnivores (including *Ursus maritimus*, on which I have no remark to make), and one Ruminant as the sum total of the Mammalian fauna of Spitsbergen. Without extending these notes by going into details, I may here state that I think the bird-fauna cannot be reckoned at more than twenty-seven species. We therefore have the singular result of a country, say as large as Ireland, where the number of Mammalian bears to the number of Ornithic species the ratio of 15 or 16 to 27.

hooked, he is hauled up on deck by a windlass, and beaten on the head until he is motionless. His liver, which alone is required of him, is then cut out; and, his entrails being fully inflated with air, his body is heaved overboard to float away quite clear of the vessel. The cause of this apparently wanton cruelty is alleged to be the difficulty of otherwise disposing of the carcase; for the fishermen say that if the animal were killed, they would not catch another Shark until the dead one was entirely eaten up by his brethren, a process that might involve a delay of some days.

\* I feel very confident of the truth of this statement; but I find no mention made of any Porpoise in the Spitsbergen seas by either Scoresby or Malmgren. This fact I unfortunately had not noticed until my return home; so that (Porpoises being in general of so common occurrence on a sea voyage) I neglected to record, as I otherwise should certainly have done, the dates and localities of their appearance. It is of course possible that what I took to be Porpoises were only the young of some larger Cetacean; but I do not think this was the case.